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CLAIMS

I CLAIM:

1. A method for producing a cathode mixture having manganese oxide particles, comprising:
 - providing a first chemical compound having manganese;
 - providing an organic reducing agent having a single carbon atom;
 - mixing the first chemical compound with the reducing agent to yield a sol of manganese oxide particles; and
 - adding the sol to a carbon slurry to produce a carbon slurry with suspended manganese oxide particles.
2. The method as recited in claim 1 wherein the first chemical compound comprises potassium permanganate.
3. The method as recited in claim 1 wherein the reducing agent comprises sodium formate.
4. The method as recited in claim 1 wherein the reducing agent is selected from the group consisting of formic acid and formaldehyde.
5. The method as recited in claim 1 wherein the mixing step is carried out approximately at a neutral pH level.
6. The method as recited in claim 1 wherein the sol contains manganese dioxide particles.
7. The method as recited in claim 1 wherein the carbon slurry comprises a mixture of activated carbon and carbon black.
8. The method as recited in claim 7, wherein the activated carbon and carbon black have a BET surface area of approximately 900 m²/g and 1500 m²/g, respectively.
9. The method as recited in claim 1 wherein a plurality of the manganese oxide particles have a size between 20 to 26 micrometers.
10. A method for producing a cathode having manganese oxide particles, comprising:

providing a first chemical compound having manganese;
providing an organic reducing agent having a single carbon atom;
5 mixing the first chemical compound with the reducing agent to yield a sol of manganese oxide particles;
adding the sol to a carbon slurry to produce a suspension of carbon slurry containing manganese oxide particles;
mixing a waterproofing agent to the suspension to produce a cathode compound;
10 and
drying and rolling the cathode compound.

11. The method as recited in claim 10, wherein the waterproofing agent is selected from the group consisting of Teflon T-30 and polyethylene. (polytetrafluoroethylene)

12. The method as recited in claim 10, further comprising laminating the cathode compound with a screen on one side and an air diffusion layer on a second side opposite the first side.

13. The method as recited in claim 12, further comprising attaching a separator to the screen.

14. The method as recited in claim 10, further comprising installing the cathode in a metal-air cell.

15. The method as recited in claim 14, wherein the metal-air cell is a zinc-air cell.

16. The method as recited in claim 14, wherein the metal air-cell is a button cell.

17. A method for producing a cathode mixture having manganese oxide particles, comprising:
providing a first chemical compound having manganese;
providing an organic reducing agent;
5 mixing the first chemical compound with the reducing agent to yield a sol of manganese oxide particles; and

particles

adding the manganese oxide compound to a carbon slurry to produce a suspension of carbon slurry with suspended manganese oxide particles.

18. The method as recited in claim 17, wherein the reducing agent is organic having a single carbon atom.